

Quality Standards for Bottled Water

Massachusetts Department of Public Health Food Protection Program

All source water used for bottled water sold in Massachusetts must meet the federal Environmental Protection Agency's (EPA) National Primary Drinking Water Standards. If the source water originates in Massachusetts, the water must also meet any additional requirements set for drinking water by the Massachusetts Department of Environmental Protection (DEP). Blended water from two or more sources originating from different states must also meet the additional DEP requirements. All source water used for carbonated nonalcoholic beverages must meet bottled water standards including private source water and public water supply water. The untreated waters of all private water sources (raw water) must be sampled and tested to characterize its microbiological, physical, radiological and chemical quality at the minimum frequency described under "source water" in the attached document.

Once water and carbonated nonalcoholic beverages are bottled, the U.S. Food and Drug Administration (FDA) Bottled Water Quality Standards apply. Manufacturers of bottled water utilizing a private water supply must have a certified laboratory perform analyses of the finished water. Manufacturers of bottled water who utilize a public water supply and perform additional treatment must have a certified laboratory perform analyses of the finished water. Manufacturers of bottled waters must test all finished product at the minimum frequency described in the attached document under "finished product". Samples of each type of finished carbonated nonalcoholic beverage product shall be taken and analyzed as frequently as necessary to ensure that all products meet the quality standards. These results need not be submitted but shall be maintained by the plant for five years.

Testing of water from water sources originating in Massachusetts must be performed by labs certified by DEP. Water originating from sources in other states must be tested by labs that are certified by the appropriate agency within the state where the laboratory is located. Water from sources outside the U.S. must be tested by laboratories which are certified by the EPA.

The following information must be included on analyses reports for all new permit and renewal applications:

1. Client's name and address.
2. Sample identification (indicating "Source" or "Finished" water, the name of the "Source" or brand of "Finished" water, and production date).
3. Sample collection date and time.
4. Sampler's name.
5. Laboratory name, address and certification number.
6. Laboratory Director's signature and date.
7. For each contaminant:
 - Result in specified units.
 - Maximum contaminant level (MCL) in specified units.
 - The method detection limit in specified units.
 - Analytical method.
 - Date analyzed.
 - Space for notation if an analysis was subcontracted to another lab. Include the name, address and certification number of the sub-contracted lab.
 - A copy of the subcontracted laboratory analysis on the letterhead or report form of the subcontracted laboratory.

Any questions regarding these standards or other issues related to the manufacture of bottled water and/or carbonated nonalcoholic beverages can be referred to the Massachusetts Food Protection Program at 617-983-6712.

KEY

MA = Massachusetts

MCL = Maximum Contaminant Level

MF = Membrane Filtration technique

MFL = Million Fibers per Liter (for fiber length greater than 10 microns)

mg/l = milligrams per liter

MRDL - Maximum Residual Disinfection Levels

MTF = Multiple Tube Fermentation technique

NR = Not Required

pCi/l = picocuries per liter

WQS = Water Quality Standard

PARAMETER	MCL	WQS	SAMPLING FREQUENCY	
	Source Water	Finished Product	Source Water	Finished Product
Microbiology				
Total Coliform	no more than one positive sample per month	9.2/100ml (MTF)	weekly	weekly
		1/100ml (MF)		
		0/100ml		
Heterotrophic Bacteria (Standard Plate Count)	500/ml (DFD guideline)	500/ml (DFD guideline)	weekly (testing recommended)	weekly (testing recommended)
		Heterotrophic bacteria interference invalidates the sample		
Physical Components (organoleptic)				
Turbidity	0.5-1.0 NTU	1-5 NTU	annually (daily if surface water)	annually
Color	15 units ^a	15 units	annually	annually
Odor	3 threshold odor numbers ^a	3 threshold odor numbers ^a	annually	annually
pH	6.8 - 8.5 ^a	----	weekly	NR
Radionuclides				
Gross Alpha Activity	15 pCi/l	15 pCi/l	annually ^b	annually
Radium 226 and 228	5 pCi/l	5 pCi/l	annually ^c	annually
Beta Particle Activity	Concentration which produces an annual dose of 4 mrem/yr	Concentration which produces an annual dose of 4 mrem/yr	once every four years	annually
Inorganic Compounds	mg/l	mg/l		
Aluminum	0.2 ^a	0.2	annually	annually
Antimony	0.006	0.006	annually	annually
Arsenic	0.01	0.01	annually	annually
Asbestos	7 MFL	No standard	annually ^d	NR
Barium	2	2	annually	annually
Beryllium	0.004	0.004	annually	annually
Cadmium	0.005	0.005	annually	annually
Chloride	250 ^a	250	annually	annually
Chromium (total)	0.1	0.1	annually	annually
Copper	1.3	1.0	annually	annually
Cyanide	0.2	0.2	annually	annually
Fluoride	2.0 ^a	2.4	annually	annually
Iron	0.3 ^a	0.3	annually	annually
Lead	0.015	0.005	annually	annually
Manganese	0.05 ^a	0.05	annually	annually

PARAMETER	MCL	WQS	SAMPLING FREQUENCY	
	Source Water	Finished Product	Source Water	Finished Product
Mercury	0.002	0.002	annually	annually
Nickel	0.1	0.1	annually	annually
Nitrate (as N)	10	10	annually	annually
Nitrite (as N)	1	1	annually ^e	annually
Nitrate/Nitrite (Total)	10	10	annually ^a	annually
Selenium	0.05	0.05	annually	annually
Silver	0.1 ^a	0.1	annually	annually
Sodium	20 (guideline level)	Required to determine if sodium labeling or nutritional labeling is required.	annually	annually
Sulfate	250 ^a	250	annually	annually
Thallium	0.002	0.002	annually	annually
Total Dissolved Solids	500 ^a	500	annually	annually
Zinc	5 ^a	5.0	annually	annually
Organic Compounds	mg/l	mg/l		
Alachlor (Lasso)	0.002	0.002	annually	annually
Aldicarb (Temik)	0.007 (0.003 for MA source)	0.003	annually	annually
Aldicarb Sulfone	0.007 (0.002 for MA source)	0.002	annually	annually
Aldicarb Sulfoxide	0.007 (0.004 for MA source)	0.004	annually	annually
Atrazine (Atranex, Crisazina)	0.003	0.003	annually	annually
Benzo(a)pyrene	0.0002	0.0002	annually	annually
Carbofuran (Furadan 4F)	0.04	0.04	annually	annually
Chlordane	0.002	0.002	annually	annually
Dalapon	0.2	0.2	annually	annually
Di(2-ethylhexyl)-adipate	0.4	0.4	annually	annually
Di(2-ethylhexyl)-phthalate	0.006	0.006	annually	annually
1,2-Dibromochloropropane (DBCP)	0.0002	0.0002	annually	annually
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.07	0.07	annually	annually
Dinoseb	0.007	0.007	annually	annually
Diquat	0.02	0.02	annually	annually
Endothall	0.1	0.1	annually	annually
Endrin	0.002	0.002	annually	annually
Ethylene dibromide (EDB)	0.00005 (0.00002 for MA source)	0.00005	annually	annually
Glyphosate	0.7	0.7	annually	annually
Heptachlor	0.0004	0.0004	annually	annually
Heptachlor epoxide	0.0002	0.0002	annually	annually
Hexachlorobenzene	0.001	0.001	annually	annually

PARAMETER	MCL	WQS	SAMPLING FREQUENCY	
	Source Water	Finished Product	Source Water	Finished Product
Hexachlorocyclopentadiene	0.05	0.05	annually	annually
Lindane	0.0002	0.0002	annually	annually
Methoxychlor (DMDT, Marlate)	0.04	0.04	annually	annually
Oxamyl	0.2	0.2	annually	annually
Pentachlorophenol	0.001	0.001	annually	annually
Picloram	0.5	0.5	annually	annually
Polychlorinated biphenyls (PCB's, Arochlor)	0.0005	0.0005	annually	annually
Simazine	0.004	0.004	annually	annually
2,3,7,8-TCDD (Dioxin)	3×10^{-8}	3×10^{-8}	annually	annually
Toxaphene	0.003	0.003	annually	annually
2,4,5-TP (Silvex)	0.05	0.05	annually	annually
Total Trihalomethanes (TTHM) (chloroform, bromoform, chlorodibromomethane, bromodichloromethane)	0.08 (0.005 for Chloroform for MA source, non-chlorinated water supplies)	0.08	annually	annually
Volatile Organic Compounds	mg/l	mg/l		
Benzene	0.005	0.005	annually	annually
Carbon Tetrachloride	0.005	0.005	annually	annually
1,2-Dichlorobenzene (o-DCB)	0.6	0.6	annually	annually
1,4-Dichlorobenzene (p-DCB)	0.075 (0.005 for MA source)	0.075	annually	annually
1,2-Dichloroethane	0.005	0.005	annually	annually
1,1-Dichloroethylene	0.007	0.007	annually	annually
1,2-Dichloroethylene (cis)	0.07	0.07	annually	annually
1,2-Dichloroethylene (trans)	0.1	0.1	annually	annually
Dichloromethane	0.005	0.005	annually	annually
1,2-Dichloropropane	0.005	0.005	annually	annually
Ethylbenzene	0.7	0.7	annually	annually
Monochlorobenzene	0.1	0.1	annually	annually
Styrene	0.1	0.1	annually	annually
Tetrachloroethylene	0.005	0.005	annually	annually
Toluene	1	1	annually	annually
1,2,4-Trichlorobenzene	0.07	0.07	annually	annually
1,1,2-Trichloroethane	0.005	0.005	annually	annually
1,1,1-Trichloroethane	0.2	0.2	annually	annually
Trichloroethylene	0.005	0.005	annually	annually

PARAMETER	MCL	WQS	SAMPLING FREQUENCY	
			Source Water	Finished Product
Vinyl Chloride	0.002	0.002	annually	annually
Xylenes (total)	10	10	annually	annually
ADDITIONAL TESTING				
USP(United States Pharmacopoeia) Testing on distilled or purified finished products	NR	USP Revision 23 or later	NR	annually

^a Secondary maximum Contaminant level

^b Gross alpha particle activity includes radium 226, but excludes radon and uranium. If levels of gross alpha particle activity are $< \frac{1}{2}$ the MCL, testing may be reduced to once every four years.

^c If gross alpha is ≤ 5 pCi/l, radium testing is not required.

^d If no asbestos is detected in first round of testing, frequency of testing may be reduced to once every nine years.

^e Sampling requirement will increase if nitrite is $\geq 50\%$ of the MCL.

DISINFECTANT BY-PRODUCTS¹

Water Type	Disinfectant Used	Potential By-Product	MCL/MRDL	Frequency of Testing
Public Water Supply	ozone, chlorine, chloramines, or chlorine dioxide	No monitoring needed if data is available from PWS.		Data from PWS may be supplied.
		If no data available monitor for:		
		Chloramines	4.0 mg/l	Annually
		Chlorine dioxide	0.8 mg/l	Annually
		Bromate	0.01 mg/l	Annually
		Chlorite	1.0 mg/l	Annually
		Haloacetic acids (HAA5).	0.06 mg/l	Annually
Private Water Source	No disinfectant used	No testing required		No testing required
Private Water Source	Ozone	Bromate	0.01 mg/l	Annually
		Haloacetic acids (HAA5)	0.06 mg/l	Annually
Private Water Source	Chlorine, chloramines, or chlorine dioxide	Haloacetic acids (HAA5)	0.06 mg/l	Annually
Finished Products²	Ozone or any chlorine based disinfectant ²	Bromate	0.01 mg/l	Annually ²
		Chlorite	1.0 mg/l	Annually ²
		Haloacetic Acids(HAA5)	0.06 mg/l	Annually ²
		Chloramine	4.0 mg/l	Annually ²
		Chlorine	4.0 mg/l	Annually ²
		Chlorine Dioxide	0.8 mg/l	Annually ²

¹ Monitoring requirement effective January 1, 2002.

² Testing is required on all finished bottled water products regardless of disinfectant use.